FACT SHEET FOR NPDES PERMIT WA-003129-1

TENASKA WASHINGTON PARTNERS, L.P.

9/8/2006

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INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the Environmental Protection Agency (EPA). The EPA has delegated responsibility to administer the NPDES permit program to the State of Washington on the basis of Chapter 90.48 RCW which defines the Department of Ecology's authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the State include:

- procedures for issuing permits (Chapter 173-220 WAC),
- water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and
- sediment management standards (Chapter 173-204 WAC).

These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see **Appendix A**--Public Involvement of the fact sheet for more detail on the Public Notice procedures). **Appendix B** includes a glossary of the terms used in this fact sheet.

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in **Appendix C** -- Response to Comments.

GENERAL INFORMATION	
Applicant	Tenaska Washington Partners, L.P.
Facility Name and Address	Tenaska Washington Cogeneration Station 5105 Lake Terrell Road Ferndale, WA 98248
Type of Facility:	Cogeneration – Steam and Electricity Production
SIC Code	4911
Process Wastewater Discharge Location Outfall 001	Waterbody name: Strait of Georgia Latitude: 48º 49' 36" N Longitude: 122º 42' 57" W.
Water Body ID Number (001)	WA-01-0010
Stormwater Discharge Location Outfall 002	Discharges into an unnamed tributary which empties into Lummi Bay Waterbody name: Lummi Bay Latitude: 48º 49' 42" N Longitude: 122º 40' 52" W.
Watercourse ID Number (002)	Un-named tributary – AT56DW Puget Sound – 390KRD

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

HISTORY

The Tenaska Cogeneration facility began commercial operational on April 7, 1994. The stormwater Outfall 002 was placed into service in June of 1994. The NPDES permit was issued on June 10, 1992 with an effective date of January 1, 1994. The permit was revised on October 5, 1994 to include an address change and several additional items. Those changes included removal of the salmonid species from the list of test organisms for the acute biomonitoring study, extension of the timeframe for conducting the discharge reduction/elimination study, and correction of the sample type for the oil and grease test. On April 30, 1995 the monitoring schedule for several parameters was reduced from daily monitoring as allowed by permit condition S1.F note f. Total Suspended Solids (TSS) testing was reduced to 3 times per week. Oil and Grease (O & G) and zinc monitoring was reduced to 2 times per week. The permit issued on August 18, 2000 reduced TSS monitoring to 2 times per week, O & G monitoring to 1 time per week, and zinc monitoring to 2 times per year. EPA classifies the facility as a minor industrial facility.

INDUSTRIAL PROCESS

Tenaska is a combined cycle, natural gas-fired cogeneration facility, which was constructed on 14 acres of land adjacent to the ConocoPhillips Ferndale Refinery. Natural gas, supplied via pipeline is the cogeneration fuel. Number 2 Fuel oil is also stored on-site and serves as a backup fuel for the combustion turbines. Tenaska supplies up to 150,000 pounds of steam per hour to ConocoPhillips and up to 270 megawatts of electricity to Puget Sound Energy. Electricity is produced primarily by two sets of gas-fired turbine generators. Exhaust from the turbines is used to produce steam. Some of the steam is used for export to ConocoPhillips while the rest is used to produce electricity by a steam turbine. The facility consists of two combustion turbines, two heat recovery steam generators, one steam turbine, an electrical substation, and a fuel unloading and storage area. The facility has a history of having been shut down for multiple months during some years due to provisions in the power purchase agreement and corresponding market conditions. The facility is staffed by approximately 23 individuals including a plant manager, operations manager, maintenance manager, plant controller, administrative assistant, purchasing assistant, lead control operator, control room operators, instrumentation and electrical technicians, maintenance staff, and a full time lab technician. Products stored on site in bulk quantities include: Number 2 fuel oil (210,000 gallons), anhydrous ammonia (12,000 gallons), caustic sodium hydroxide (6000 gallons), and sulfuric acid (6000 gallons). Each of these storage tanks includes adequate containment. The fuel tank storage area has an isolation drain valve which discharges to the stormwater system. This area is not drained unless it is first checked for spilled material. The chemicals are stored in tanks with a concrete curbed containment, which drains to the chemical waste collection and treatment sump in the event of a spill. A variety of cooling water chemicals are used and stored on site. They include slimicides, biocides, sodium hypochlorite, and corrosion inhibitors. Wastewater treatment chemicals include flocculant and

coagulant polymers. Other chemical products stored on site include lubrication oils, hydraulic fluid, gas turbine cleaner, transformer, and other electrical oils.

WASTEWATER SOURCES AND TREATMENT

Wastewater sources include cooling water blowdown, oil/water separator effluent, wastewater return flows, backwashes from the water treatment system, and discharges into the chemical wastewater sump. Drainage from areas around the ammonia storage tank, the water demineralizer system (acid and caustic), laboratory, battery room, clarifier area and the circulating chemical feed building are fed into the chemical wastewater sump. All areas with a potential for oil spills are curbed and drain into the oil/water separator. These areas include the gas turbine area, Steam Turbine lube oil skid, air compressor area, transformer pads, and pump pads.

Process wastewaters are treated with various chemical/physical treatment methods depending on the nature of the pollutants. The oil water sewer collects wastewater from the process area (pump pads and process drains) which could potentially have oily pollutants. This wastewater flows through an oil water separator to remove oil and greases. A disposal contractor periodically removes oil. The underflow effluent from the oil/water separator wastewater is discharged to a drain sump, which is pumped to the wastewater tank. Areas of the facility, which have a potential for a chemical spill, are curbed and surfaced with discharges going into the chemical waste sump adjacent to the Water Treatment Building. Wastewater from the regeneration of anion and cation resin beds is routed to the chemical waste sump. This wastewater is pumped to the neutralization tank where the wastewater is neutralized in a batch process. The neutralization tank effluent is discharged into the wastewater tank. The commingled wastewater is then clarified in a unit identified as a solids contact unit. The solids from this unit are thickened in a sludge thickener and then routed through a sludge press. The sludges are disposed of in the local landfill. Effluent from the solids contact units is polished in a filtration system and is then discharged into the adjacent ConocoPhillips' wastewater effluent line.

Stormwater from areas other than process units is routed to a retention basin. It then flows via an underflow weir through a biofiltration swale and is discharged. The retention basin was cleaned out in October and November 1998. Sand and sediment were removed by vacuum truck and sent off-site for thermal desorption. The sand and sediment were tested to ensure compliance with dangerous waste regulations. Several liner tears were repaired during the cleanout operation. Additional operations and maintenance procedures were developed for the stormwater basin after the completion of the liner maintenance.

Sanitary wastewater is treated in a mound system, which is regulated by the Whatcom County Health Department.

DISCHARGE DESCRIPTIONS

Tenaska facility maintains two outfalls (001 and 002). The discharge from each of the outfalls is described below. A map of the location of ConocoPhillips' wastewater discharge Outfall 001 and Tenaska's stormwater discharge Outfall 002 can be found in **Appendix D**.

Outfall 001: Treated process wastewater is discharged into ConocoPhillips' Outfall 001, which discharges into the Strait of Georgia. ConocoPhillips has a submerged diffuser consisting of a single pipe with four diffuser ports.

Outfall 002: Treated stormwater is discharged to a ditch along Lake Terrell Road. From Lake Terrell Road, the discharge is routed through ConocoPhillips property in a drainage ditch, which flows into a ditch along Slater Road. Within this ditch it commingles with stormwater from the ConocoPhillips facility. This ditch discharges to Lummi Bay. Prior to being discharged into marine water the ditch may flow through a wetland area.

PERMIT STATUS

The previous permit for this facility was issued on August 18, 2000. The previous permit placed effluent limitations on the discharges as shown in the following tables.

PROCESS WASTEWATER DISCHARGE 001		
PARAMETER	DAILY AVERAGE	DAILY MAXIMUM
Total Suspended Solids (mg/l)	20	35
Oil and Grease (mg/l)	10	15
Total Chromium (mg/l)	0.2	0.2
Total Zinc (mg/l)	1.0	1.0
Total Residual Chlorine (mg/l)	0.2	0.2
pH	Within the range of 6.0 to 9.0	

STORMWATER DISCHARGE 002		
PARAMETER	DAILY AVERAGE	DAILY MAXIMUM
Total Suspended Solids (mg/l)	15	25
Oil and Grease (mg/l)	10	15
pH	Within the range of 6.0 to 9.0	

A permit renewal application was submitted to the Department on March 4, 2005 and accepted by the Department on April 6, 2005.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility last received a Class II Wastewater inspection on February 28, 2006, which included collecting grab samples from both the process wastewater and stormwater discharges. The facility was found in compliance with the permit at the time of inspection. The last non-sampling inspection was completed on October 6, 2005.

During the history of the previous permit, the Permittee has remained in compliance based on Discharge Monitoring Reports (DMRs) submitted to the Department and inspections conducted by the Department (See **Appendix E**). The Permittee experienced a TSS exceedance resulting from the sample taken on September 4, 2002 at Outfall 002. The last discharge from Outfall 002 prior to September 4, 2002 was on July 16, 2002 due to unusually dry weather. The stormwater sat in the basin for a length of time allowing algae growth which caused the TSS exceedance. The Department determined that the result was considered to be from a non-representative sample that did not accurately reflect the quality of Tenaska's effluent discharge at Outfall 002 on that date. No formal enforcement was issued for this exceedance.

REVIEW OF PREVIOUS PERMIT REQUIREMENTS

The previous permit required Tenaska to submit the following reports during the permit term. These reports fulfilled the requirements of the Department.

Submittal Requirement	**Date Required**	**Date Submitted**
Priority Pollutant Scan	Annually	March 23, 2004
Updated Treatment System Operating Plan	By March 4, 2005	March 4, 2005
Updated Solid Waste Control Plan	By March 4, 2005	March 4, 2005
Updated Spill Plan	By March 1, 2001 & March 4, 2005	March 4, 2005
Acute & Chronic Toxicity Effluent Recharacterization Study Report	By March 4, 2005	March 4, 2005

WASTEWATER CHARACTERIZATION

The following tables summarize the wastewater characterization presented in the NPDES permit renewal application for Outfalls 001 and 002 dated March 4, 2005.

Table 1: Wastewater Characterization Outfall 001

Parameter	# of Samples	Maximum Daily	Long Term Average
Oil and Grease mg/l	32	7.2	0.61
Total Suspended Solids (TSS) mg/l	32	14.8	1.9
Ammonia (as Nitrogen) mg/l	1	0.06	
Total Chlorine Residual mg/l	32	0.06	0.01
Copper µg/l	1	9.0	
Sulfate mg/l	1	310	
Zinc µg/l	2	120	
Total Organic Carbon (TOC) mg/l	1	2.16	
pH	136	Minimum 6.49	Maximum 7.94
Temperature ºC		20 (winter) 24.4 (summer)	15.2 (winter) 20.2 (summer)
No priority pollutant organics were found in detectable quantities.			

Table 2: Wastewater Characterization Outfall 002

Parameter	# of Samples	Maximum Daily	Long Term Average
Total Suspended Solids (TSS) mg/l	35	17.6	4.7
Oil and Grease mg/l	35	5.2	0.2
Nitrate/Nitrite mg/l	1	0.9	
Iron mg/l	1	2.6	
Zinc mg/l	1	0.21	

PROPOSED PERMIT LIMITATIONS

Federal and State regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations are based upon the treatment methods available to treat specific pollutants. Technology-based limitations are set by regulation or developed on a case-by-case basis (40 CFR 125.3, and Chapter 173-220 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (Federal

Register, Volume 57, No. 246, Tuesday, December 22, 1992). The more stringent of these two limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the State of Washington were determined and included in this permit. Ecology does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent**.** Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation. Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department of Ecology. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

DESIGN CRITERIA

In accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria. Wastewater flows through the facility have remained within design criteria from plant start-up.

The most limiting criteria, the average and maximum design flow through the solids contact unit and the wastewater filter were included in the permit.

Table 1: Design Standards for Process Wastewater Treatment Units.

Parameter	Average Design Capacity	Maximum Capacity
Solids Contact Unit (Clarifier)	225 gpm / 324,000 gpd	300 gpm / 432,000 gpd
Wastewater Filter	225 gpm / 324,000 gpd	300 gpm / 432,000 gpd

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Guidelines for the steam electric power generating point source category (40 CFR 423) were initially published November 19, 1982 and amended July 8, 1983 by the Environmental Protection Agency (EPA). The new source performance standards (NSPS) for the pertinent wastestreams produced by Tenaska are summarized in the table below. The quantity of pollutants discharged may not exceed the quantity determined by multiplying the wastestream flow by the concentration listed in the table.

NSPS Limitations		
Parameter	**Monthly Average**	**Daily Maximum**
Cooling Water Blowdown		
Free Available Chlorine	0.2 mg/l	0.5 mg/l
Chromium, total	0.2 mg/l	0.2 mg/l
Zinc, total	1.0 mg/l	1.0 mg/l
Low Volume Waste Sources		
Total Suspended Solids	30 mg/l	100 mg/l
Oil & Grease	15 mg/l	20 mg/l

The federal effluent limitations for this category give the permit writer the discretion to express the allowable discharge quantity as a concentration limit rather than a mass limit. The technology-based concentration values in the NSPS section of the federal effluent guidelines were used except as indicated in the following discussion.

The daily average and daily maximum permit limits proposed (see following table) for total suspended solids (TSS), oil and grease, and total residual chlorine are more stringent than the federal guideline allowances. The TSS limitations are the same as the previous permit, which were based on Best Professional Judgment (BPJ). The oil and grease daily average and daily maximum values are the same as the previous permit and reflect State policy. Because the facility has demonstrated that they can meet those limits, they reflect all known, available and reasonable treatment (AKART) methodologies. Federal effluent limitations are based on the free available chlorine test methodology. Tenaska has been required to test for total residual chlorine. The quantity of free available chlorine is either equal to or less than the total residual chlorine of a sample depending on the chemistry of the sample. Therefore, using the total residual chlorine test is at least as stringent as using the free available chlorine test. Chromium is not and has not been used in the industrial process and is not detectable in the effluent. Zinc is not a component of chemical additives in use today. Zinc's inclusion in the federal effluent guidelines was due to the common use of cooling tower biocides, and corrosion and scaling control chemicals containing zinc chloride, zinc dichromate, zinc oxides, zinc sulfate, calcium zinc polyphosphate, potassium zinc polyphosphate, and zinc chloride. These chemicals are no longer in common use or in use at the Tenaska facility. Limits for chromium and zinc have been included in the permit but the monitoring frequency has been reduced to annually, the minimum allowed by federal requirements.

In addition to the above requirements best available treatment economically achievable (BAT) requirements include a condition that the effluent shall not include 126 priority pollutants, with the exception of chromium and zinc, in detectable amounts. Chromium and zinc have specific limits. Tenaska has not had any organic priority pollutants detected in the effluent in the history of the facility. Metals have been detected in the effluent at low levels because they are present in

the source water and may be incidentally added in the process. Metals detection levels have greatly improved since the federal effluent guidelines were published in 1982. Metallic parameters were also evaluated to ensure protection of aquatic life and no metal demonstrated reasonable potential to exceed water quality criteria. The Permittee is required to perform annual **metal** priority pollutant testing for the final effluent.

In consideration of Permittee's history of compliance and the results of previous sample analyses, the Permittee is required to perform the priority **organic** pollutant testing for the final effluent once during the last year of the permit term.

The stormwater effluent limitations in the permit are based upon Best Professional Judgment (BPJ), State policy and the facility's demonstrated ability to meet these limitations.

PROPOSED PERMIT LIMITATIONS OUTFALL 001		
Parameter	**Monthly Average**	**Daily Maximum**
Total Suspended Solids mg/l	20	35
Oil & Grease mg/l	10	15
Zinc, total mg/l	1.0	1.0
Chromium, total mg/l	0.2	0.2
Total Residual Chlorine	0.2	0.2
pH	Within the range of 6.0 to 9.0	

PROPOSED PERMIT LIMITATIONS OUTFALL 002		
Parameter	**Monthly Average**	**Daily Maximum**
Total Suspended Solids mg/l	15	25
Oil & Grease mg/l	10	15
pH	Within the range of 6.0 to 9.0	

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Surface water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin wide total maximum daily loading study (TMDL).

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the State of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The U.S. EPA has promulgated 91 numeric water quality criteria for the protection of human health that are applicable to Washington State (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the State of Washington.

ANTIDEGRADATION

The State of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when the natural conditions of a receiving water are of higher quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The Department has reviewed existing records and is unable to determine if ambient water quality is either higher or lower than the designated classification criteria given in Chapter 173-201A WAC; therefore, the Department will use the designated classification criteria for this water body in the proposed permit. The discharges authorized by this proposed permit should not cause a loss of beneficial uses.

CRITICAL CONDITIONS

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

MIXING ZONES

The State Water Quality Standards allow Ecology to authorize mixing zones for wastewater discharges that would otherwise exceed the water quality criteria for aquatic life or human health. Ecology can only authorize a mixing zone for those discharges which have been provided with the applicable technology-based treatment. Mixing zones are areas around treated wastewater discharges where the water quality standards may be exceeded but are small enough so as not to interfere with beneficial uses of the receiving water body, such as swimming, drinking, and fish habitat. Ecology allows mixing zones because the concentrations and effects of most pollutants diminish rapidly after discharge, due to dilution. Ecology establishes mixing zones that limit the amount of time the discharge could potentially cause harm to water quality, plants, or fish. Ecology typically authorizes a standard sized mixing zone and protects water quality at the edges of the zone. All states have a mixing zone policy or regulation. Washington's allowance is one of the most restrictive in the nation.

A mixing zone is a boundary in the receiving water around a point of discharge. The amount of mixing which occurs inside the zone is estimated through modeling to determine the potential for a violation of the water quality standards and to derive effluent limitations if necessary. Steady-state models are the most frequently used tools for conducting mixing zone analyses. Ecology chooses values for each effluent and receiving water variable that correspond to the time period when the most critical condition is likely to occur, (see Ecology's Permit Writer's Manual Page V1-26 and V11-12 & 13). Each critical condition parameter (by itself) has a low probability of occurrence and the resultant dilution factor is conservative. The term reasonable worst-case' is applied to these values.

The key products from a mixing zone analysis are the dilution factors or dilution ratios. Dilution ratios are unit-less. They are a measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Dilution ratios represent the available dilution in the mixing zone. For example, a dilution ratio of 10 means the effluent comprises 10% by volume and the receiving water 90%. Dilution ratios are used in conjunction with the water quality criteria for calculating reasonable potentials and effluent limits. There are aquatic life-based water quality criteria and human health-based water quality criteria. The former are applied at the acute and chronic mixing zone boundaries, the latter are applied at the chronic boundary. The methodology for conducting aquatic life-based analyses and human health-based analyses are similar.

Each aquatic life acute criteria is based on the assumption that organisms are not exposed to that concentration for more than one-hour not to be exceeded more than once in three years. Each aquatic life chronic criteria is based on the assumption that organisms are not exposed to that concentration for more than four days not to be exceeded more than once in three years.

There are two types of human health-based water quality criteria: those based on non-cancer effects (non-carcinogenic) and those based on cancer effects (carcinogenic). The human health-based water quality criteria incorporate several exposure and risk assumptions. These include: (1) a 70-year lifetime of daily exposures, (2) an ingestion rate for fish or shellfish in kg/day, (3) 2 liters/day ingestion rate for drinking water, and a one-in-one million excess cancer risk for

carcinogenic chemicals. In general, these exposure assumptions will provide a safe level of protection for most individuals.

This permit authorizes both an acute and a chronic mixing zone around the point of discharge as allowed by Chapter 173-201A WAC, *Water Quality Standards for Surface Waters of the State of Washington*. The Water Quality Standards stipulate some criteria be met before a mixing zone is allowed. The requirements and Ecology's actions are summarized as follows:

1. The allowable size and location be established in a permit.

This permit specifies the size and location of the allowed mixing zone.

2. Fully apply "all known available and reasonable methods of treatment" (AKART).

The technology-based limitations determined to be AKART are discussed in an earlier Section of this fact sheet (see Technology-based Limitations).

3. Consider critical discharge condition.

The critical discharge condition is often pollutant-specific or water body-specific and is discussed above.

4. Supporting information clearly indicates the mixing zone would have no reasonable potential to cause a loss of sensitive or important habitat, substantially interfere with existing or characteristic uses, result in damage to the ecosystem or adversely affect public health.

The Department of Ecology has reviewed the information on the characteristics of the discharge, receiving water characteristics, and the discharge location. Based on this information, Ecology believes this discharge does not have a reasonable potential to cause the loss of sensitive or important habitat, substantially interfere with existing or characteristics uses, result in damage to the ecosystem or adversely affect public health.

5. Water quality criteria shall not be violated (exceeded) outside the boundary of a mixing zone.

A reasonable potential analysis, using procedures established by USEPA and the Department of Ecology, was conducted for each pollutant to assure there will be no violations of the water quality criteria outside the boundary of a mixing zone.

6. The size of the mixing zone and the concentrations of the pollutants shall be minimized.

The size of the mixing zone (in the form of the dilution factor) has been minimized by the use of design criteria with low probability of occurrence. For example, the reasonable potential analysis used the expected 95th percentile pollutant concentration, the 90th percentile background concentration, the centerline dilution factor and the lowest flow occurring once in every 10 years.

7. Maximum size of mixing zone

The authorized mixing zone does not exceed the maximum size restriction.

8. Acute Mixing Zone

A. Acute criteria met as near to the point of discharge as practicably attainable.
The acute criteria have been determined to be met at 10% of the distance of the chronic mixing zone at the ten year low flow.

B. The concentration of, and duration and frequency of exposure to the discharge, will not create a barrier to migration or translocation of indigenous organisms to a degree that has the potential to cause damage to the ecosystem.

The toxicity of pollutants is dependent upon the exposure which in turn is dependent upon the concentration and the time the organism is exposed to that concentration. For example EPA gives the acute criteria for copper as "freshwater aquatic organisms and their uses should not be affected unacceptably if the 1- hour average concentration (in µg/l) does not exceed the numerical value given by $(0.960)(e^{(0.9422[\ln(\text{hardness})] - 1.464)})$ more than once every three years on the average." The limited acute mixing zone authorized for this discharge will assure that it will not create a barrier to migration. The effluent from this discharge will rise as it enters the receiving water assuring that it will not cause translocation of indigenous organism near the point of discharge.

C. Comply with size restrictions
The mixing zone size authorized by Chapter 173-201A WAC for this discharge meets the restrictions.

9. Overlap of Mixing Zones
This mixing zone does not overlap another mixing zone.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

DESCRIPTION OF THE RECEIVING WATER

Tenaska's process wastewater Outfall 001 discharges to ConocoPhillips Refinery's effluent line. ConocoPhillips' effluent discharges to the Strait of Georgia, which is designated as a Class AA marine receiving water in the vicinity of the outfall. Characteristic uses include the following: Water supply (domestic, industrial, agricultural); stock watering; fish migration; fish and shellfish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation. Water quality of this class shall markedly and uniformly exceed the requirements for all or substantially all uses.

The stormwater Outfall 002 discharges into a ditch alongside Lake Terrell Road. From Lake Terrell Road, the discharge drains through ConocoPhillips property in a ditch, which flows into a ditch along Slater Road. Within this ditch it commingles with stormwater from the ConocoPhillips facility. This ditch drains into an unnamed tributary which classifies as a Class AA freshwater receiving water. This unnamed tributary discharges to Lummi Bay, which is designated as a Class AA receiving water in the vicinity of the outfall with characteristic uses as described above.

SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for this discharge are summarized below:

Fecal Coliforms	14 organisms/100 ml maximum geometric mean (marine water)
	100 organisms/100 ml maximum geometric mean (fresh water)
Dissolved Oxygen	7 mg/L minimum (marine water)
	9.5 mg/L minimum (freshwater)
Temperature	13 degrees Celsius maximum or incremental increases above background (marine water)
	16 degrees Celsius maximum or incremental increases above background (freshwater)
pH	7 to 8.5 standard units (marine water)
	6.5 to 8.5 standard units (freshwater)
Turbidity	less than 5 NTU above background
Toxics	No toxics in toxic amounts

Lummi Bay and the Strait of Georgia are both listed on the 1998 national CWA 303(d) list of water quality impaired water bodies. Fecal coliform is the pollutant of concern in Lummi Bay, which must be addressed by limiting the total maximum daily load (TMDL) of pollutants allowed to discharge into the water bodies. The Strait of Georgia is listed for a variety of pollutants many of which were found in the sediments at the ConocoPhillips refinery.

The following pollutants were found during the 2004 sediment sampling around the ConocoPhillips discharge outfall: phenanthrene, pyrene, indeno (1,2,3-cd) pyrene, dibenzo (a,h) anthracene, benzo (g,h,i) perylene, benzo (a) pyrene, benzo (a) anthracene, chrysene, fluoranthene, benzo (b,k) fluoranthene, phenanthrene, acenaphthene, total PCBs, dibenzofuran, cadmium, and fluorene. Specifically, phenanthrene, fluoranthene, and dibenzofuran exceeded sediment quality standard (SQS) criteria at Stations 1 and 2. But follow-up bioassay testing at the affected stations did not reveal any hits. Since stations 1 and 2 showed PAH/organic chemical contamination during this sampling effort, ConocoPhillips will be required to conduct additional sediment sampling in the next permit. Tenaska's priority pollutant testing of its own effluent showed none of the pollutants listed above.

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Pollutant concentrations in the discharge will meet water quality criteria, using technology-based controls that the Department determined to be AKART (when factoring in the applicable dilution available at the discharge outfall). The permit authorizes a mixing zone at Tenaska's process wastewater outfall, in accordance with the geometric configuration, flow restriction, and other restrictions on mixing zones in Chapter 173-201A WAC.

In November 1995 an engineering consultant prepared a dilution analysis for ConocoPhillips. The report was entitled, **Final Report** Dilution Ratio and Reasonable Potential Analysis. The dilution factors of effluent to receiving water have been determined at the critical condition by the use of several different EPA approved mixing models. Following Ecology review and comments mixing zone values were determined for the ConocoPhillips facility. Those mixing zones apply to the Tenaska facility (Outfall 001) since it discharges its effluent into ConocoPhillips' discharge line. The mixing zone values are tabulated as follows:

	Available Dilution
Acute Criteria	30
Chronic Criteria	135
Human Health Criteria - Carcinogen	135
Human Health Criteria - Non-carcinogen	135

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants--their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating surface water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of surface water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

The impacts of temperature, pH, and metals were determined as shown below, using the dilution factors at critical conditions described above.

Temperature

For Class AA marine water, the water quality standards state the temperature shall not exceed 13°C due to human activities. When natural conditions exceed 13°C no temperature increases will be allowed which will raise the receiving water temperature greater than 0.3°C. Incremental temperature increases resulting from point source activities shall not, at any time, exceed $t = 8/(T-4)$. T represents the background temperature and represents the highest ambient water temperature in the vicinity of the discharge.

A simple mixing analysis at critical conditions modeled the impact of the discharge on the temperature of the receiving water. The receiving water temperature critical condition was determined using the 90th percentile value of the temperatures recorded at the ambient monitoring station GRG002 from 1989 to 2005. Because the effluent is discharged into ConocoPhillips' effluent line the analysis includes ConocoPhillips' flows. The receiving water temperature at the critical condition is 11.8 °C. The maximum summertime effluent temperature for Tenaska and ConocoPhillips are 24.4 °C and 30 °C respectively. The following analysis was complete using average flow values for each facility (Tenaska 0.22 MGD and ConocoPhillips 2.62 MGD). Under average conditions Tenaska's flow contribution is approximately 8% of the total flow discharged. With a dilution of 135:1 at the edge of the chronic zone the predicted resultant temperature at the boundary of the chronic mixing zone is 11.93 °C. This was

calculated using a simple mass balance equation as follows: [11.8(135) + 24.4(.08) + 30(.92)] / 136 = 11.93 °C. The predicted resultant temperature meets the water quality standards.

The highest recorded temperature at GRG002 (from 1989 to 2005) was 19.5 °C. The incremental temperature increase allowance (t = 8/(19.5 - 4)) is equal to 0.5 °C. With a receiving water temperature of 19.5 °C and a combined effluent temperature of 29.6 °C the predicted temperature at the edge of the dilution zone is equal to 19.57 °C. This was calculated using a simple mass balance equation as follows: [19.5(135) + 29.6] / 136 = 19.6 °C. The temperature increase of 0.1 °C is less than the incremental temperature allowance of 0.5 °C or the maximum increase of 0.3 °C allowed by water quality standards.

Under these conditions there is no predicted violation of the Water Quality Standards. An effluent limitation was determined not to be necessary.

pH--Because of the high buffering capacity of marine water, compliance with the technology-based limits of 6 to 9 will assure compliance with the Water Quality Standards for Surface Waters.

Turbidity--The impact of turbidity was evaluated based on the range of turbidity in the effluent and turbidity of the receiving water. Due to the large degree of dilution and the low turbidity level of the effluent, it was determined that the turbidity criteria would not be violated outside the designated mixing zone.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

The following toxics were determined to be present in the process wastewater discharge (001): arsenic, total residual chlorine, copper, and zinc. A reasonable potential analysis (See **Appendix F**) was conducted on these parameters to determine whether or not effluent limitations would be required in this permit. The determination of the reasonable potential for the above toxics to exceed the water quality criteria was evaluated with procedures given in EPA, 1991 at the critical condition. The critical condition in this case occurs in May through October. Valid marine ambient background data was available for metallic parameters (Batelle, 1998). Calculations using all applicable data resulted in a determination that there is no reasonable potential for this discharge (001) to cause a violation of water quality standards. This determination assumes that the Permittee meets the other effluent limits of this permit.

Stormwater Discharge - Outfall 002

A mixing zone has been established for the stormwater discharge (Outfall 002) in the NPDES permit. The mixing zone shall extend downstream from the discharge port no greater than 300 feet plus the depth of water at the discharge port and shall extend upstream for a distance no greater than 100 feet. It shall not utilize greater than 25 percent of the flow, and shall not occupy greater than 25 percent of the width of the water body.

Continued monitoring of toxics will provide a database to set limits when stormwater mixing zone guidance or a regulation is available. If future data collected indicate a problem a mixing study may be required to determine the actual mixing available or additional best management practices may be warranted.

WHOLE EFFLUENT TOXICITY

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests are providing an indication of the potential lethal effect of the effluent to organisms in the receiving environment.

Chronic toxicity tests measure various sublethal toxic responses such as retarded growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test of an organism with an extremely short life cycle or a partial life cycle test on a critical stage of one of a test organism's life cycles. Organism survival is also measured in some chronic toxicity tests.

Accredited WET testing laboratories have the proper WET testing protocols, data requirements, and reporting format. Accredited laboratories are knowledgeable about WET testing and capable of calculating an NOEC, LC_{50}, EC_{50}, IC_{25}, etc. All accredited labs have been provided the most recent version of the Department of Ecology Publication # WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* which is referenced in the permit. Any Permittee interested in receiving a copy of this publication may call the Ecology Publications Distribution Center 360-407-7472 for a copy. Ecology recommends that Permittees send a copy of the acute or chronic toxicity sections(s) of their permits to their laboratory of choice.

The acute toxicity tests during effluent characterization (see **Appendix G**) indicate that no reasonable potential exists to cause receiving water acute toxicity, and the Permittee will not be given an acute WET limit and will only be required to retest the effluent prior to application for permit renewal in order to demonstrate that acute toxicity has not increased in the effluent.

The chronic toxicity tests during effluent characterization indicate that no reasonable potential exists to cause receiving water chronic toxicity, and the Permittee will not be given a chronic WET limit and will only be required to retest the effluent prior to application for permit renewal in order to demonstrate that chronic toxicity has not increased in the effluent.

If the Permittee makes process or material changes which, in the Department's opinion, results in an increased potential for effluent toxicity, then the Department may require additional effluent characterization in a regulatory order, by permit modification, or in the permit renewal. Toxicity is assumed to have increased if WET testing conducted for submission with a permit application fails to meet the performance standards in WAC 173-205-020, "whole effluent toxicity performance standard". The Permittee may demonstrate to the Department that changes have not

increased effluent toxicity by performing additional WET testing after the time the process or material changes have been made.

CHERRY POINT HERRING ISSUES

During the last 20 years, there has been a severe decline in the herring stock that spawns in the Cherry Point area. The Department of Ecology has been working with several stakeholders including other agencies, area industries, and the tribes to investigate the Cherry Point herring decline. Over the past six years, Ecology has worked with Western Washington University's Shannon Point Marine Center (SPMC) to develop herring tests to evaluate effluent toxicity as a source of the decline.

As a result of these efforts, SPMC developed three herring tests. These three tests are a larval acute survival test, an embryo survival and development test, and a larval survival and growth test. The larval acute test and the embryo survival and development test were successfully validated by SPMC and a commercial lab, Nautilus Environmental. A test is successfully validated if a lab can get a reasonably consistent answer each time the test is performed using the same toxicant. In November 2005, Ecology approved the regulatory use of the two tests.

The permit includes a requirement to conduct herring bioassay testing.

HUMAN HEALTH

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the Permittee's effluent is unlikely to contain organic chemicals regulated for human health and does not contain most chemicals of concern based on several priority pollutant scans and our knowledge of the industry. A worst case analysis of the discharge using the available mixing zone and the detection limit of the analysis showed some parameters, which if present at the detection limit would exceed human health criteria at the edge of the mixing zone. These parameters, with the exception of arsenic (see discussion below), were not detected and are highly unlikely to be present in this discharge considering the nature of the industry inputs. Reasonable potential to exceed human health criteria is determined for each parameter in **Appendix F**. The determination indicated that the discharges from Outfalls 001 have no reasonable potential to cause a violation of water quality standards, thus an effluent limit is not warranted.

Arsenic

In 1992 the USEPA adopted risk-based arsenic criteria for the protection of human health for the State of Washington. The criterion for marine waters is 0.14 µg/L inorganic arsenic, and is based on exposure from fish and shellfish tissue ingestion. The freshwater criterion is 0.018 µg/L, and is based on exposure from fish and shellfish tissue and water ingestion. These criteria have caused confusion in implementation because they differ from the drinking water maximum contaminant level (MCL) of 10 µg/L, which is not risk-based, and because the human health

criteria are sometimes exceeded by natural background concentrations of arsenic in surface water and ground water.

In Washington, when a natural background concentration exceeds the criterion, the natural background concentration becomes the criterion, and no dilution zone is allowed. This could result in a situation where natural groundwater or surface water used as a municipal or industrial source-water would need additional treatment to meet numeric effluent limits even though no arsenic was added as waste. Although this is not the case for all dischargers, we do not have data at this time to quantify the extent of the problem.

A regulatory mechanism to deal with the issues associated with natural background concentrations of arsenic in groundwater-derived drinking waters is currently lacking. Consequently, the Water Quality Program, at this time, has decided to use a three-pronged strategy to address the issues associated with the arsenic criteria. The three strategy elements are:

1. Pursue, at the national level, a solution to the regulatory issue of groundwater sources with high arsenic concentrations causing municipal treatment plant effluent to exceed criteria. The upcoming revision of the MCL for arsenic offers a national opportunity to discuss how drinking water sources can affect NPDES wastewater dischargers. This discussion should focus on developing a national policy for arsenic regulation that acknowledges the risks and costs associated with management of the public exposure to natural background concentrations of arsenic through water sources.

2. Additional and more focused data collection. The Water Quality Program will in some cases require additional and more focused arsenic data collection, will encourage or require dischargers to test for source water arsenic concentrations, and will pursue development of a proposal to have Ecology's Environmental Assessment Program conduct drinking water source monitoring as well as some additional ambient monitoring data. At this time, Washington NPDES permits will contain numeric effluent limits for arsenic based only on treatment technology and aquatic life protection as appropriate.

3. Data sharing. Ecology will share data with USEPA as they work to develop new risk-based criteria for arsenic and as they develop a strategy to regulate arsenic. The Department has determined that the effluent must be evaluated for the presence of chemicals of concern for human health. The discharger's high priority is based on its status as a major discharger and knowledge of data and process information indicating that regulated chemicals occur in the discharge. The discharge was therefore evaluated for reasonable potential to violate the human health criteria.

SEDIMENT QUALITY

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

The Department has determined through a review of the discharger characteristics and effluent characteristics that this discharge has no reasonable potential to violate the Sediment Management Standards.

ConocoPhillips will be required to conduct a sediment recharacterization study in the next NPDES permit. Since this discharge is combined with the ConocoPhillips' discharge, the study will evaluate the potential impacts of the Tenaska discharge.

GROUND WATER QUALITY LIMITATIONS

The Department has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect beneficial uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

Both the stormwater pond and biofiltration swale are lined. The accumulated sludge in the stormwater pond was cleaned out in the fall of 1998. At that time a tear in the liner was discovered and repaired. This Permittee has no ongoing discharge to ground and therefore no limitations are required based on potential effects to ground water.

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

The monitoring schedule is detailed in the proposed permit under Condition S.1. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring.

PERFORMANCE BASED REDUCTION OF MONITORING FREQUENCIES

EPA published guidance in April of 1996 entitled, "Interim Guidance for Performance-Based Reduction of NPDES Permit Monitoring Frequencies". EPA's goal is to reduce the regulatory burden associated with reporting and monitoring on the basis of excellent performance. Ecology adopted a modified policy in the July 1996 revision to the Water Quality Program's Permit Writer's Manual. Total suspended solids, oil & grease, total residual chlorine, and zinc were evaluated using this guidance. The guidance recommends looking at and comparing long term average values to permit limits. In addition to using the approach recommended in the guidance, maximum values were also compared with permit limits. The following table summarizes approximately two years of recent data and baseline, current and proposed monitoring frequencies.

OUTFALL 001	TSS	Oil & Grease	Total Residual Chlorine
	lb/day	mg/l	mg/l
Monthly Average permit limit in current permit	20	10	0.2
Daily maximum permit limit in current permit	35	15	0.2
Long-term average (geometric mean for fecal coliform)	1.9	0.61	0.01
Long-term average / monthly average permit limit (% basis)	10%	6%	5%
Maximum of the monthly averages	6.6	3.6	0.03
Maximum Value	14.8	7.2	0.06
Current permit monitoring frequency	2/7	1/7	1/7
Policy monitoring recommendations	1/7	1/7	1/7
Proposed permit monitoring frequency	1/7	1/7	1/7

LABORATORY ACCREDITATION

With the exception of certain parameters the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories.* The laboratory at this facility is accredited for: total suspended solids (TSS), pH, zinc, total residual chlorine, and the Freon method for oil and grease.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions of S3. are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 273-220-210).

SPILL PLAN

The Department has determined that the Permittee stores a quantity of chemicals that have the potential to cause water pollution if accidentally released. The Department has the authority to

require the Permittee to develop best management plans to prevent this accidental release under section 402(a)(1) of the Federal Water Pollution Control Act (FWPCA) and RCW 90.48.080.

The Permittee submitted an updated spill plan with the renewal permit application on March 4, 2005. The spill plan fulfills the requirements in the current permit.

The proposed permit requires the Permittee to update this plan and submit it with the next renewal permit application and other updates as necessary. The purpose of the plan is to prevent the accidental release of pollutants to state waters and to minimize damages if such a spill occurs.

SOLID WASTE PLAN

The Permittee submitted an updated solid waste control plan with the renewal permit application on March 4, 2005. The solid waste control plan fulfills the requirements in the current permit.

This proposed permit requires, under the authority of RCW 90.48.080, that the Permittee submit an updated solid waste plan with the next permit renewal application and other updates as necessary. The plan is designed to prevent solid waste from causing pollution of the waters of the state.

TREATMENT SYSTEM OPERATING PLAN

In accordance with state and federal regulations, the Permittee is required to take all reasonable steps to properly operate and maintain the treatment system (40 CFR 122.41(e)) and WAC 173-220-150 (1)(g). The Permittee submitted an updated Treatment System Operating Plan (TSOP) on March 4, 2005. The Department reviewed and determined that the plan meets the requirements in the current permit. The proposed permit requires that an updated TSOP be submitted with the next permit application for renewal and other updates as necessary.

BEST MANAGEMENT PRACTICES

The Clean Water Act provides for water pollution controls, such as Best Management Practices (BMPs) to supplement effluent limitation guidelines. Pursuant to RCW 90.48 and sections 304 and 402 of the Clean Water Act, BMPs may be incorporated as permit conditions. BMPs are actions or procedures to prevent or minimize the potential for the release of pollutants or hazardous substances in significant amounts to surface waters.

To ensure the proper operation of the stormwater management pond Best Management Practices have been included in the permit.

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual industrial NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards for Surface Waters, Sediment Quality Standards, or Water Quality Standards for Ground Waters, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to control toxics, protect human health, aquatic life, and the beneficial uses of waters of the State of Washington. The Department recommends that this proposed permit be issued for 5 years.

REFERENCES FOR TEXT AND APPENDICES

Crecelius, Eric

1998. Background Metals Concentrations in Selected Puget Sound Marine Receiving Waters. Batelle Marine Services Laboratory.

Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.

1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.

1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.

1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

Washington State Department of Ecology.

1994. Permit Writer's Manual. Publication Number 92-109

Washington State Department of Ecology.

Laws and Regulations(http://www.ecy.wa.gov/laws-rules/index.html)

Permit and Wastewater Related Information (http://www.ecy.wa.gov/programs/wq/wastewater/index.html

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

The Department placed a Public Notice and Request for Comments on June 7, 2006 in *the Bellingham Herald* and in Ferndale's *Westside Record-Journal***.** We also mailed notices to a list of persons, via either postal or electronic means. The notices informed the public where to read copies of the proposed permit and the fact sheet. Readers were invited to submit written comments about the adequacy of the draft permit, by 5:00 p.m. July 7, 2006 to:

Liem Nguyen
Department of Ecology
Industrial Section
PO Box 47706
Olympia, WA 98504-7706

Anyone could comment on the merits of the draft permit, within the thirty (30) day comment period, to the address above. Public comments could help us write a better permit.

The Department considers the merits of all comments received within thirty (30) days from the date of public notice, in formulating a final determination to issue, revise, or deny the permit. A printed copy of our response to all significant comments is available upon request.

You may obtain more details about this permit and our process for defining the permit limits, restrictions, and requirements, by phoning Mr. Nguyen in Lacey (360/407-6955**)**, or by writing to him at the address listed above.

Liem Nguyen wrote this permit and fact sheet**.**

APPENDIX B--GLOSSARY

Acute Toxicity--The lethal effect of a compound on an organism that occurs in a short period of time, usually 48 to 96 hours.

AKART-- An acronym for "all known, available, and reasonable methods of treatment".

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation --The average of the measured values obtained over a calendar month's time.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD_5--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD_5 is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of a treatment facility.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity--The effect of a compound on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Additional sampling may be conducted.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots).

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Dilution Factor--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the percent effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Engineering Report--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Major Facility--A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minor Facility--A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone--An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in state regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Quantitation Level (QL)-- A calculated value five times the MDL (method detection level).

Responsible Corporate Officer-- A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or have gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures (40 CFR 122.22).

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Upset--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit--A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C – RESPONSE TO COMMENTS

WASHINGTON DEPARTMENT OF ECOLOGY

RESPONSE TO PUBLIC COMMENTS

TENASKA FERNDALE COGENERATION FACILITY
NPDES PERMIT WA 003129-1

August 23, 2006

Public notice proposing to issue the Tenaska NPDES Permit was published on June 7, 2006. Ecology received comments only from Ecosystems First LLC.

A copy of this response to comments is being sent to each individual who provided written comment. As a time and space saving measure, comments have been summarized. A summary of the comments received is included for your information. The original comment letter is available at Ecology's office in Lacey. Anyone interested in obtaining a copy of the full text of the comments or of a particular comment should call Liem Nguyen at (360) 407-6955.

Comments:

Mr. John Boettner, Ecosystems First LLC:

In order to avoid, minimize, or mitigate impacts to the Cherry Point aquatic ecosystem, we should consider the prolonged chronically depressed condition of the Cherry Point herring stock by monitoring the more sensitive phases of the herring life cycle and responding proactively to contribute to ecosystem and resource recovery.

The site-by-site approach of the NPDES permit process does not address cumulative impacts. Where commingling of effluent occurs, the NPDES permit is limited to the one (Tenaska) source of the effluent in absence of other pollutants; there is nothing in the permit that shows potential for chemical and/or physical response of effluent in reaction to the presence of additional pollutants from other sources (TOSCO), not to mention the potential of chemical agents like PAHs to react (individually or in combination) with light (photo enhanced toxicity), heat, or other factors.

It is important to be comprehensive in our approach to permitting future industrial activity to take place in the Cherry Pt aquatic ecosystem. It is essential that chronically affected resources such as Cherry Pt herring are given consideration prior to every

decision made by stakeholders and managers in control of effluent and facilities management.

By itself, the Tenaska effluent does not represent the sole source of the environmental problems we see at Cherry Pt, but (just as all of Cherry Pt industry) it is a contributing factor, and my concern is that the NPDES process has failed to adequately characterize (or distinguish between) these factors. As we speak, regulators continue the process of reviewing additional requests for aquatic development at Cherry Pt without considering the implications of cumulative effects and resource consequences. Scientists and managers working on the aquatic ecosystem at Cherry Pt continue to struggle; they remain incapable of characterizing what scale of adverse impacts can be accommodated, and what parameters are essential to sustain an area that represents a remnant of Puget Sound pristine environments.

The current configuration of the TOSCO pier creates a groin structure that interrupts hydraulic flow characteristics within the water column; it also impedes sediment migration and limits contaminant dispersion.

The TOSCO creosote pilings are also a substantial source of contaminants that contribute to water quality degradation, and should be included into the NPDES permitting process, not to mention monitoring of sediment.

If improvements to the current TOSCO structure could be made, newer designs in pier construction would substantially improve flow characteristics, and upgrade water quality with potential for increased flushing (to say nothing of the effects on the aquatic ecosystem).

The additive nature of temperature inputs is an environmental concern, especially during periods of naturally occurring of high temperatures. The cumulative nature of permitted and unpermitted temperature inputs alone have never been fully characterized or understood, nor are there sufficient efforts to try to mitigating for these types of impacts.

Given the chronically depressed status of Cherry Pt herring that has remained constant for nearly a decade, not to mention the additive nature of human caused temperature input, it would indicate increased scrutiny of all NPDES permits be required under State “narrative” criteria (WAC 173-201A-030) and Antidegradation Policy.

In the interest of the Antidegradation Policy, protecting a chronically stressed herring resource, including species of salmon, trout, and whales listed under the Endangered Species Act (ESA), this effort is being conducted to request the following action be taken:

1. Initiate plans to address water quality on a landscape scale to address receiving water health, including monitoring of collective endpoints of water quality impacts.

2. Continue herring and mussel *in situ* studies as described including new developments in technology.

3. Increase scrutiny of input of temperature, including retrofitting enhancements/ improvements in water quality treatment, avoid, minimize, and mitigate where appropriate, etc.

In the past, Tenaska has been successful in its efforts to improve operation practices to reduce effluent impact; however, the current status of the chronically depressed herring resource would suggest there is still room for improvement.

Response:

Concerns about herring decline

The Department of Ecology (Ecology) has been working with several stakeholders including other state agencies, area industries, and the tribes (the Cherry Point Technical Workgroup) to investigate the Cherry Point herring decline.

The Cherry Point herring stock has been a great concern to Washington State in recent years. It once had a spawning biomass equal to that of all of the other herring stocks in the state combined. The Cherry Point stock size declined from nearly 15,000 tons in 1973 to just above 800 tons in 2000. Stock size has been slowly growing since then. Recruitment at Cherry Point was generally good during much of the period of decline. Recruitment is the number of first time spawners and is a direct measure of the success of reproduction two years earlier. Recruitment from 1974 to 1995 averaged 2121 tons. 1994 had a record recruitment of 4076 tons. However, recruitment dropped steeply in 1996 and only averaged 755 tons from 1996 to 2001.

Herring testing requirements

Ecology permit writers began including herring testing requirements in industry NPDES permits in the Cherry Point area in order to rule out effluent toxicity as being the cause of the decline in recruitment. Herring test requirements have also been included in other permits for Puget Sound dischargers and herring tests have been used to assess the toxicity of ballast water biocides and the effects of an oil spill.

Because standardized methods for conducting herring toxicity tests did not exist, Ecology signed a contract in 2000 with Western Washington University's Shannon Point Marine Center (SPMC) in Anacortes to begin test development efforts. SPMC has developed three herring tests to meet the permit requirements. These three tests are a 96-hour larval acute survival test, a 10-day embryo survival and normal development test, and a 10-day larval survival and growth test.

SPMC and a commercial lab, Nautilus Environmental, conducted validation studies of the three herring tests during the 2005 herring spawning season. A validation study determines if a lab can get a reasonably consistent answer each time a test is

performed using the same toxicant. Both labs successfully validated the 96-hour larval acute survival test and 10-day embryo survival and normal development test. As of November 2005, these protocols were available for testing effluents and receiving waters. The labs could not completely validate the 10-day larval survival and growth test, but its partial success and the knowledge gained by the labs promise better performance on the next attempt in 2007.

Ecology has determined that the herring tests can be used to answer several important questions. These questions include measuring the ambient toxicity to herring in the Cherry Point Reach and determining the tolerance of herring embryos in high water temperatures. Ecology sent out letters to industry, environmental groups, and tribes requesting funding for additional herring studies. In April 2006, Ecology signed an agreement with industry to provide $235,000 to fund additional herring research and study. This includes funding for the following projects in 2007:

- $75,500 toward the refinement and revalidation of the herring larval survival and growth test
- $41,500 toward an ambient water toxicity evaluation in the Cherry Point Reach during the spring herring spawning season
- $31,000 toward an embryo temperature tolerance study of the Cherry Point herring and two other regional stocks (Puget Sound and coastal or Strait of Juan de Fuca)

The additional studies will help to address questions of cumulative impacts from industrial discharges in the Cherry Point area and temperature effects on the more sensitive life phase of the herring cycle.

Tenaska's herring testing requirements

The renewed NPDES permit, Condition S11, requires Tenaska to conduct a herring test (96-hour Pacific Herring Larval acute toxicity test on the effluent) once per permit cycle. Should this test indicate toxicity, the permit requires additional testing and that Tenaska conduct a Toxicity Identification/Reduction Evaluation.

Ecology reviewed ConocoPhillips' (TOSCO's) Sediment Data Report dated December 2004. Sediment chemistry exceedances of the sediment quality standards were found at the two stations nearest Outfall 001. Follow-up bioassay testing at the affected stations did not identify any hits. Therefore, we determined that sediment quality in the area of ConocoPhillips' pier is in compliance with the Sediment Management Standards (SMS) rule, Chapter 173-204 WAC.

Oil spills could significantly affect sediment quality and could help explain elevated PAH compounds in sediments near the pier. Ecology is planning to require that ConocoPhillips perform the following tasks during the next permit cycle. (Work has begun on the ConocoPhillips NPDES permit renewal. A proposed permit should be public noticed in the first part of 2007.)

- Provide a comprehensive list of oil spills for the last ten years, the type of oil product, and release location(s) in the Sediment Study Plan
- Re-sample stations 1 and 2 which showed PAH/organic chemical contamination during the last sampling study
- Conduct an underwater video of Outfall 001 and surrounding area including stations 1 and 2 locations to identify any evidence of oil spill impacts to sediment quality

At Tenaska, circulating water is used for cooling purposes. Tenaska manages the temperature of this water using cooling tower technology where heat energy is removed through the evaporation process. The majority of Tenaska's effluent comes from cooling tower basin blowdown with much of the heat content removed prior to discharge. The fact sheet for the proposed permit presents Ecology's analysis of temperature impacts from the Tenaska discharge. The Tenaska discharge mixes with ConocoPhillips' effluent in a conveyance line prior to reaching the receiving water. Using maximum summertime temperatures and average flow values for the two effluents and factoring in the mixing that occurs in the conveyance line and in the receiving water, the predicted temperature is below State Water Quality Standards. If the results of the temperature tolerance study discussed above indicate adverse effects on herring embryos at temperatures equivalent to or less than what is predicted in the receiving water, Ecology will work with Tenaska to evaluate upstream changes to reduce or mitigate any temperature impacts.

The big picture

Ecology acknowledges that it is difficult to look at wholistic or area-wide impacts under the current wastewater discharge permitting system. Ecosystem problems like the Cherry Point herring decline are not easily addressed this way. The Department is working with other agencies to combine efforts and knowledge to evaluate cumulative impacts and take a more comprehensive approach to areas and issues of concern.

The commenter mentions several other possible causes for the herring decline and recommendations for additional study or changes that could mitigate adverse effects from Tenaska and ConocoPhillips (TOSCO). Ecology has chosen to focus on several areas of research and study during this permit cycle. The results of these efforts will be evaluated to determine any necessary mitigation measures and future permit requirements. The Department will also continue to work with the Cherry Point Technical Workgroup to identify other areas for regulatory study or emphasis.

APPENDIX D – FACILITY LOCATION MAP

APPENDIX E – MONTHLY DISCHARGE MONITORING REPORTS

APPENDIX F – REASONABLE POTENTIAL TO EXCEED ANALYSIS

APPENDIX G – WHOLE EFFLUENT TOXICITY TESTING

ACUTE WET TESTING

Start Date	Organism	Endpoint	NOEC	LOEC	MSDp
2/1/00	Pimephales promelas	96h Proportion Survived	100	>100	4.59%
4/18/00	Pimephales promelas	96h Proportion Survived	100	>100	
8/3/04	Ceriodaphnia dubia	48h Proportion Survived	100	>100	5.00%
8/3/04	Pimephales promelas	96h Proportion Survived	100	>100	6.30%
1/4/05	Pimephales promelas	96h Proportion Survived	100	>100	8.43%
1/7/05	Ceriodaphnia dubia	48h Proportion Survived	100	>100	15.49%

REVIEWING WET TEST DATA

Acute Data:

% survival date - if any test < 65%, then need acute limit or if more than one test < 80% then need acute limit

LOEC data - If LOEC < ACEC then need chronic limit

Chronic Data:

If LOEC < ACEC then need chronic limit
If LOEC < CCEC then required to conduct follow-up bioassays and TI/RE

CHRONIC WET TESTING

Start Date	Title	Organism	Endpoint	NOEC	LOELq	LOEC	MSDp
8/3/04	Echinoid Fertilization Test	Dendraster excentricus	Proportion Fertilized	100	>	100	0.064116
8/3/04	Chronic Mysid Survival, Growth and Fecundity Test	Mysidopsis bahia	7d Proportion Survived	100	>	100	0.096215
8/3/04	Chronic Mysid Survival, Growth and Fecundity Test	Mysidopsis bahia	Mean Dry Weight-mg	100	>	100	0.09994
8/3/04	Chronic Mysid Survival, Growth and Fecundity Test	Mysidopsis bahia	Mean Dry Biomass-mg	100	>	100	0.145798
8/3/04	Chronic Larval Fish Survival and Growth Test	Atherinops affinis	7d Proportion Survived	100	>	100	0.248201
8/3/04	Chronic Larval Fish Survival and Growth Test	Atherinops affinis	Mean Dry Weight-mg	100	>	100	0.171523
8/3/04	Chronic Larval Fish Survival and Growth Test	Atherinops affinis	Mean Dry Biomass-mg	100	>	100	0.237521
1/4/05	Chronic Mysid Survival, Growth and Fecundity Test	Mysidopsis bahia	7d Proportion Survived	100	>	100	0.124943
1/4/05	Chronic Mysid Survival, Growth and Fecundity Test	Mysidopsis bahia	Mean Dry Biomass-mg	100	>	100	0.163577
1/4/05	Chronic Larval Fish Survival and Growth Test	Atherinops affinis	7d Proportion Survived	100	>	100	0.168507
1/4/05	Chronic Larval Fish Survival and Growth Test	Atherinops affinis	Mean Dry Biomass-mg	100	>	100	0.218429
1/6/05	Echinoid Fertilization Test	Strongylocentrotus purpuratus	Proportion Fertilized	64	>	64	0.141128

WET Test Results as % Survival in 100% Effluent

Test Date	Organism		% Survival
2/1/00	Pimephales promelas	96h Proportion Survived	95.0%
4/18/00	Pimephales promelas	96h Proportion Survived	100.0%
7/18/00	Pimephales promelas	96h Proportion Survived	100.0%
8/3/04	Ceriodaphnia dubia	48h Proportion Survived	100.0%
8/3/04	Pimephales promelas	96h Proportion Survived	90.0%
1/4/05	Pimephales promelas	96h Proportion Survived	100.0%
1/7/05	Ceriodaphnia dubia	48h Proportion Survived	90.0%